AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (amended): A pumping device comprising a substrate having walls which define a microchannel, a first electrode, and a second electrode, wherein said first and second electrodes are positioned to form a first capacitor having an electric field that traverses the microchannel, ~~and~~ wherein the microchannel contains a first fluid and a second fluid between the electrodes, said first and second fluids having a first interface therebetween and said first and second fluids having different dielectric constants such that the first interface between said fluids moves in the presence of the electric field, and wherein the first electrode is configured to have a first potential applied to a first end of the electrode and a second potential applied to a second end of the electrode.

Claim 2 (cancelled)

Claim 3 (cancelled)

Claim 4 (original): A pumping device according to claim 1 wherein the microchannel is a continuous channel.

Claim 5 (original): A pumping device according to claim 4 wherein said microchannel has a tapered portion having a fluid interface therein.

Claim 6 (original): A pumping device according to claim 1 wherein the microchannel is a discontinuous channel having a first end and a second end.

Claim 7 (original): A pumping device according to claim 1 wherein the microchannel has at least one reservoir in fluid communication with the microchannel.

Claim 8 (original): A pumping device according to claim 7 wherein said reservoir contains said first fluid, wherein said first fluid is a liquid, wherein said reservoir is sealed, and wherein said reservoir further contains a gas.

Claim 9 (amended): A pumping device according to claim 1 wherein the substrate defines one or more flow-restricting indentations ~~into~~ in the microchannel having a size sufficient to restrain free flow of a liquid through the microchannel.

Claim 10 (original): A pumping device according to claim 1 wherein a portion of the walls forming the microchannel has a coating applied thereon of sufficient hydrophobicity that the coating restrains flow of a polar liquid through the microchannel.

Claim 11 (original): A pumping device according to claim 1 wherein the first fluid and the second fluid are liquids.

Claim 12 (original): A pumping device according to claim 1 wherein the microchannel contains a third fluid in a portion of the microchannel that is not immediately between said first and second electrodes.

Claim 13 (original): A pumping device according to claim 12 wherein the third fluid contains a biological molecule.

Claim 14 (original): A pumping device according to claim 12 wherein the third fluid comprises a drug.

Claim 15 (original): A pumping device according to claim 12 wherein the third fluid has a refractive index suitable for a core or cladding of an optical telecommunications device.

Claim 16 (original): A pumping device according to claim 1 and further comprising a third electrode and a fourth electrode positioned to form a second capacitor having an electric field that traverses the microchannel.

Claim 17 (original): A pumping device according to claim 16, wherein the third electrode is configured to have a first potential applied to a first end of said electrode and a second potential applied to a second end of said electrode.

Claim 18 (original): A pumping device according to claim 1 wherein a first portion of the microchannel has a cross-sectional area that is greater than a cross-sectional area of a second portion of the microchannel.

Claim 19 (original): A pumping device according to claim 18 wherein said microchannel has a third portion that tapers between said first portion and said second portion.

Claim 20 (original): A pumping device according to claim 19 wherein said microchannel has a second fluid interface positioned in said third portion.

Claim 21 (amended): A method of moving a first fluid in a microchannel, said method comprising placing an interface formed by said first fluid and a second fluid in an electric field generated by a capacitor having a first plate at a first potential and a second plate at a second potential by placing a first end of the second plate at the second potential and placing a second end of the second plate at a third potential, said second potential being greater than said first potential and said third potential being less than said first potential, wherein said first fluid and said second fluid have sufficiently dissimilar dielectric constants that said interface moves in the presence of said electric field.

Claim 22 (cancelled)

Claim 23 (amended): A method according to claim ~~22~~ 21 wherein the method further comprises changing at least one of said first, second, and third potentials to move said interface a second time.

Claim 24 (original): A method according to claim 21 wherein said method further comprises moving a third fluid that is in communication with said first fluid.

Claim 25 (amended): A method of using dielectric pumping, said method comprising moving a fluid volume within a microchannel in an optical telecommunications device using a method according to claim 21.

Claim 26 (amended): A method of using dielectric pumping, said method comprising moving a fluid volume within a microchannel to react or analyze a biological or chemical sample using a method according to claim 21.

Claim 27 (new): A pumping device comprising a substrate having walls which define a microchannel, a first electrode, and a second electrode, wherein said first and second electrodes are positioned to form a first capacitor having an electric field that traverses the microchannel, wherein the microchannel contains a first fluid and a second fluid between the electrodes, said first and second fluids having a first interface therebetween and said first and second fluids having different dielectric constants such that the first interface between said fluids moves in the presence of the electric field, wherein the first electrode is configured to have a first potential applied to a first end of the electrode and a second potential applied to a second end of the electrode, and wherein the second electrode is configured to have a third potential applied to said electrode, wherein the third potential is greater than said first potential, and wherein the third potential is less than said second potential.